

## REMARKS

The present application was filed on September 12, 2003 with claims 1 through 29. Claims 1 through 29 are presently pending in the above-identified patent application.

5 In the present Office Action, the Examiner objected to the drawings and rejected claims 1-29 under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. The Examiner rejected claims 1, 2, 5-14, 17, 22-26, and 29 under 35 U.S.C. §112, first paragraph, because “the specification, while being enabling for describing the method of generating new names for new patterns (is) not consistent with the specifications matching Figures 3A and 3B.” The Examiner rejected claims 1-17, 20-26, and 29 under 35 U.S.C. §102(b) as being anticipated by Floratos, “DELPHI: A Pattern-based Method for Detecting Sequence Similarity,” rejected claims 18 and 27 under 35 U.S.C. §103(a) as being unpatentable over Floratos, in view of Savitch, “Problem Solving with C++,” and rejected claims 19 and 28 under 35 U.S.C. §103(a) as 10 being unpatentable over Floratos, and Savitch, and further in view of Fredman, “Two Applications of a Probabilistic Search Technique: Sorting X+Y and Building Balanced 15 Search Trees.”

Drawings and Section 112 Rejections

The Examiner objected to FIGS. 3A and 3B and rejected claims 1, 2, 5-14, 20 17, 22-26, and 29 under 35 U.S.C. §112, first paragraph, because “the specification, while being enabling for describing the method of generating new names for new patterns (is) not consistent with the specifications matching Figures 3A and 3B.” In particular, the Examiner noted that the substring *S* contains only one ‘j,’ while FIGS. 3A and 3B indicate that substring *S* contains two ‘j’ characters.

25 The specification has been amended to include two ‘j’ characters in substring *S*. Applicants believe that this amendment addresses the Examiner’s concerns and respectfully request that the objections to the drawings be withdrawn.

Section 101 Rejections

Claims 1-29 were rejected under 35 U.S.C. §101 because the claimed 30 invention is directed to non-statutory subject matter. In particular, the Examiner asserts that the invention has not been limited to a substantial practical application.

The Supreme Court has stated that the "[t]ransformation and reduction of an article 'to a different state or thing' is the clue to patentability of a process claim." *Gottshalk v. Benson*, 409 U.S. 63, 70, 175 U.S.P.Q. (BNA) 676 (1972). In other words, claims that require some kind of transformation of subject matter, which has been held to include intangible subject matter, such as data or signals, that are representative of or constitute physical activity or objects have been held to comply with Section 101. See, for example, *In re Warmerdam*, 31 U.S.P.Q.2d (BNA) 1754, 1759 n.5 (Fed. Cir. 1994) or *In re Schrader*, 22 F.3d 290, 295, 30 U.S.P.Q.2d (BNA) 1455, 1459 n.12 (Fed. Cir. 1994).

Thus, as expressly set forth in each of the independent claims, the claimed methods or system describe discovering permutation patterns from an input string having a plurality of characters, each character being from an alphabet, and transform the input string to permutation patterns. This transformation to permutation patterns provides a useful, concrete and tangible result. For example, the Background section of the present disclosure describes how such permutation patterns are utilized in medical applications related to genes and proteins.

Applicants submit that each of claims 1-29 are in full compliance with 35 U.S.C. §101, and accordingly, respectfully request that the rejection under 35 U.S.C. §101 be withdrawn.

Independent Claims 1, 20 and 29

Independent claims 1, 20, and 29 were rejected under 35 U.S.C. §102(b) as being anticipated by Floratos. Regarding claim 1, the Examiner asserts that Floratos teaches "using changes in the names to determine the permutation patterns" (page 457, C2:5-15; 'Permutation patterns' of applicant is equivalent to 'K' of Floratos).

Applicants note that Floratos is directed to a different problem than the present disclosure. Floratos is directed to "identifying *sequence similarity* between a query sequence and a database of proteins." (Page 455, first paragraph; emphasis added.) Floratos searches for an *ordered sequence in a string*. The claims of the present disclosure are directed to *discovering permutation patterns*. As would be apparent to a person of ordinary skill in the art, permutation patterns indicate that the patterns are related to a *non-ordered set of characters*. For instance, dictionary.com teaches that the

permutations of (1,2,3) are (1,2,3) (2,3,1) (3,1,2) (3,2,1) (1,3,2) (2,1,3). Independent claims 1, 20, and 29 require using changes in the names to determine the *permutation patterns*.

Thus, Floratos does not disclose or suggest using changes in the names to 5 determine the permutation patterns, as required by independent claims 1, 20, and 29.

#### Additional Cited References

Savitch was also cited by the Examiner for its disclosure of wherein the at 10 least one character is a single character and wherein the step of selecting further comprising selecting a portion of the input string that differs from the previously selected portion of the input string by moving a window one character, from the previously selected portion, along the input string, the window selecting the new portion of the input string. Applicants note that Savitch is directed to a program using an array. Savitch does not address the issue of using changes in names to determine permutation patterns.

Thus, Savitch does not disclose or suggest using changes in the names to 15 determine the permutation patterns, as required by independent claims 1, 20, and 29.

Fredman was also cited by the Examiner for its disclosure of wherein the sets of names are stored in a balanced search tree. Applicants note that Fredman is directed to a search method that translates into an insertion sort, and to the construction of 20 probabilistically binary search trees. Fredman, however, does not address the issue of using changes in names to determine permutation patterns.

Thus, Fredman does not disclose or suggest using changes in the names to determine the permutation patterns, as required by independent claims 1, 20, and 29.

#### Dependent Claims 2-19 and 21-28

Dependent claims 2-17 and 21-26 were rejected under 35 U.S.C. §102(b) 25 as being anticipated by Floratos, claims 18 and 27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Floratos, in view of Savitch, and claims 19 and 28 were rejected under 35 U.S.C. §103(a) as being unpatentable over Floratos, and Savitch, and further in view of Fredman.

Claims 2-19 and 21-28 are dependent on claims 1 and 20, respectively, 30 and are therefore patentably distinguished over Floratos, Savitch, and Fredman (alone or in any combination) because of their dependency from independent claims 1 and 20 for

the reasons set forth above, as well as other elements these claims add in combination to their base claim.

All of the pending claims, i.e., claims 1-29, are in condition for allowance and such favorable action is earnestly solicited.

5 If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

The Examiner's attention to this matter is appreciated.

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Respectfully submitted,



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